

CLAIMS:

1. A process for producing a boron coated abrasive, the process including the steps of contacting the abrasive to be coated with a boron source, at a coating temperature of about 800°C to about 1200°C in an inert atmosphere, for a time sufficient to coat at least a portion of the abrasive.
2. A process according to claim 1, wherein the abrasive is in the form of abrasive particles, larger abrasive bodies, or abrasive tools.
3. A process according to claim 1 or claim 2, wherein the boron source comprises boron powder.
4. A process according to claim 3, wherein the boron powder is combined with boric acid.
5. A process according to claim 4, wherein the ratio of boron powder to boric acid is 1:0 to 1:1 by weight.
6. A process according to claim 5, wherein the ratio of boron powder to boric acid is about 1:0.7 by weight.
7. A process according to any one of the preceding claims, wherein the process is carried out at a temperature of about 800°C to about 1150°C.
8. A process according to claim 7, wherein the process is carried out at a temperature of about 1100°C to about 1150°C.
9. A process according to claim 8, wherein the process is carried out at a temperature of about 1150°C.

10. A process according to any one of the preceding claims, wherein the process includes a preheating step, the preheating step comprising heating the abrasive and boron source incrementally to a temperature of about 250°C to about 500°C, and maintaining them at that temperature for a period of about 15 minutes to about 45 minutes.
11. A process according to claim 10, wherein the preheating step comprises heating the abrasive and boron source incrementally to a temperature of about 300°C, and maintaining them at that temperature for a period of about 30 minutes.
12. A process according to claim 10 or claim 11, wherein the abrasive and boron source are incrementally heated to the coating temperature at about 5°C/minute to about 15°C/minute.
13. A process according to claim 12, wherein the abrasive and boron source are incrementally heated to the coating temperature at about 10°C/minute.
14. A process according to any one of the preceding claims, wherein the abrasive and boron source are heated at the coating temperature for at least 30 minutes.
15. A process according to claim 14, wherein the abrasive and boron source are heated at the coating temperature for at least 3 hours.
16. A process according to claim 15, wherein the abrasive and boron source are heated at the coating temperature for at least 6 hours.
17. A process according to any one of the preceding claims, wherein the ratio of abrasive to boron source is about 1:0.2 to about 1:20 by weight.

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18. A process according to claim 17, wherein the ratio of abrasive to boron source is about 1:2 by weight.
19. A process according to any one of the preceding claims, wherein the abrasive is diamond or cubic boron nitride.